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PATENT

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	E. Wendell Diller
Application No.:	09/923272
Filed:	August 3, 2001
For:	Elongate Vented Gun Barrel (quiet gun)
Examiner:	Michelle Clement
Group Art Unit:	3641

Mail Stop RCE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Docket No.: D55.2B-10027-US01

DECLARATION PURSUANT TO 37 C.F.R. §1.132

1. My name is Alan Corzine and I received an engineering degree in mechanical engineering from the University of Missouri - Rolla in 1984.
2. I have been a mechanical engineer for 22 years and I am skilled in fluid dynamics and aerodynamics. I have 22 years experience in product development, strategic business planning and technical PR in the small arms ammunition business across commercial, law enforcement, military and industrial categories. I have been the director of research and development at Winchester for 8 years. I was also the director of technology (R&D and engineering) at Federal Cartridge and CCI-Speer for 3 years. Prior to my executive management experience, I served as an ammunition product development engineer for 14 years with Winchester and Olin Ordnance. A more complete record of my employment history related to weapon design and development is identified in my attached resume.
3. Based upon my experience I believe that I am a person skilled in the art of weapon design and fluid dynamics.

*Application No. 09/923272  
Page 2*

*Declaration  
Attorney Docket No. D55.2B-10027-US01*

4. I have read and understand U.S. Patent App. No. 09/923,272 and the claims as attached hereto as Exhibit 1. I am providing this Declaration in support of the patentability of the Wendell Diller application disclosed in App. No. 09/923,272 and as identified in the claims attached hereto as Exhibit 1.

5. Claim 1 of Exhibit 1 is reproduced below:

Claim 1. A firearm comprising:  
a) one elongate barrel having a breach end a muzzle end and a discharge opening, said elongate barrel having a length dimension, said length dimension being of at least 3 ½ feet; and  
b) a plurality of vents disposed through said elongate barrel, said vents initiating beyond twelve inches from said breach end, said vents terminating proximate to said muzzle end, said vents having a size of approximately 3/8 inch in diameter or greater, said vents being constructed and arranged to minimize sound report by gradual release of gasses directly to the surrounding atmosphere through said vents along said length dimension of said barrel toward said muzzle end of said firearm following discharge of said firearm, said vents minimizing gas pressure proximate to said muzzle end.

6. In my opinion, the disclosure of U.S. Patent App. No. 09/923,272, and the claims, in conjunction with the knowledge that one skilled in the art has of fluid dynamics and weapons design, enables a person skilled in the art to make, use, and/or reproduce the invention as disclosed in claim 1, for the provision of vents along an elongate firearm barrel to minimize sound report and gas pressure at the muzzle end, due to the gradual discharge of gasses along the length of the gun barrel through the vents.

7. In my opinion, based upon the specification and claim 1 of U.S. Patent App. No. 09/923,272, and my knowledge of fluid dynamics and weapons design, I could duplicate the venting requirements to minimize sound report for the elongated vented gun barrel without undue experimentation.

*Application No. 09/923272  
Page 3*

*Declaration  
Attorney Docket No. D55.2B-10027-US01*

8. I have read and understood claim 19 of U.S. Patent App. No. 09/923,272, which is reproduced below:

Claim 19. A firearm comprising:

- a) one elongate barrel having a breach end and a muzzle end, said elongate barrel having a length dimension, said length dimension being of at least 3 ½ feet; and
- b) a plurality of vents disposed through said elongate barrel, said vents initiating beyond twelve inches from said breach end, said vents terminating proximate to said muzzle end, said vents positioned along the barrel to minimize sound report by gradual release of gasses directly into the atmosphere through said vents along said length dimension of said barrel toward said muzzle end of said firearm following discharge of said firearm, said vents reducing gas pressure proximate to said muzzle end.

skilled in the art of fluid dynamics and weapons design, enables a person skilled in the art to make, use, and/or reproduce the invention as disclosed in claim 19 identified above without undue experimentation.

10. I have read and understand U.S. Patent 5,844,162 to Renner, which discloses a barrel having vents or ports positioned adjacent to the muzzle end of a firearm barrel. The purpose of the vents or ports of the Renner 5,844,162 patent are in my opinion to direct combustion gasses perpendicular to the axis of the bore to reduce recoil and "barrel jump" which improves aiming and accuracy. This was common practice for weapon manufacturers and gun designs at the time of, and before, Renner of 1998. The Renner 5,844,162 patent of 1998 addresses the SPECIFIC needs peculiar to a muzzle loading rifle to reduce recoil and barrel jump and to prevent damage to the wadding or patches employed in a muzzle loading rifle thereby minimizing risk of damage to the barrel.

*Application No. 09/923272  
Page 4*

*Declaration  
Attorney Docket No. D55.2B-10027-US01*

11. In my opinion, the vents of the Renner patent 5,844,162 are not designed to minimize sound report due to the gradual release of gasses directly to the surrounding atmosphere through the vents. Renner does not provide any assistance in the venting of an elongated gun barrel, along the length of the elongated gun barrel, to minimize sound report and minimize the pressure of gasses proximate to the muzzle end, by the gradual release of gasses into the atmosphere through the vents placed along the length of the barrel. The minimization of sound report through venting along the length of the barrel is not apparent to a person skilled in the art reviewing the Renner patent 5,844,162.

12. I have also reviewed and discharged a prototype of a firearm of Wendell Diller which I believe is representative of claims 1 and 19 as identified herein. The sound report upon discharge of the Diller prototype in my opinion is, in fact, minimized as compared to other firearm barrels which I have observed, designed, and/or discharged during my years of experience in firearm design. In the past, single firearm "barrels" as known usually did not have a length dimension exceeding three feet. The firearm, including the stock, may have exceeded three feet in length, but the specific single barrel usually did not. It is my understanding that the problem of reducing or minimizing sound report or percussion within a conventional single barrel firearm was unavailable without the use of a federally regulated silencer. Venting of a single barrel of conventional length did not provide sufficient distance and/or time to permit the gradual release of gas pressure to minimize sound report, therefore, a federally regulated/prohibited silencer was required. The use of any number, size, or location of vents along a single barrel of conventional length did not minimize sound report. Only when an elongated single barrel was utilized, did sufficient distance and time become available to utilize vents, to minimize sound report at the muzzle end, through the gradual release of gasses along the length dimension of the elongated

*Application No. 09/923272  
Page 5*

*Declaration  
Attorney Docket No. D55.2B-10027-US01*

barrel through vents, and thus eliminating the need for a federally regulated silencer. At the time of Mr. Diller's invention, it did not occur to me to elongate a single barrel having a conventional length to increase the distance and time for gradual release of gasses along the length of a single barrel through vents, to minimize sound report and eliminate the necessity of silencer. I wish I had conceived of the sound minimizing vents along the length of the elongate barrel as invented by Mr. Diller. The firearm as identified within claims 1 and 19 herein would not have been obvious to a person of ordinary skill in the art, because the inventions identified in claims 1 and 19 were not obvious to me, without the prior exposure to the Diller application, claims, and Diller prototype herein.

13. I have read and understand U.S. Patent No. 5,315,914 to Schumacher which is directed to an over-under or side-by-side style firearm where each barrel has a discharge opening at the muzzle end and interior vents between the two adjacent barrels. The Schumacher Patent No. 5,315,914 does not teach the release of gasses into the atmosphere, except through the discharge openings at the muzzle ends of the two adjacent barrels, which act as a gun silencer chamber. The Schumacher Patent No. 5,315,914 does not teach the gradual release of gasses directly into the atmosphere as required by the BATF to avoid being classified as a gun silencer. Gun silencers employ a series of vents down the length of the bore of the silencer, in the same manner as the Schumacher Patent 5,315,914, which allows the gasses to escape into an adjacent chamber, which in turn allows the escape of the gasses into the atmosphere at the muzzle opening at a lower velocity and sound pressure level. The series of vents in the Schumacher Patent No. 5,315,914 are vented into the empty adjacent chamber barrel, which is the same chamber technology of a common gun silencer. The Schumacher Patent No. 5,315,914 simply employs the adjacent empty barrel as a crude gun silencer chamber, and the venting from the bore of the active

*Application No. 09/923272  
Page 6*

*Declaration  
Attorney Docket No. D55.2B-10027-US01*

barrel into what functions as the silencer chamber of the adjacent barrel, is simply a longer silencer bore than is used in gun silencers that are designed specifically for optimum silencer performance.

14. In my opinion, the interior vents of the Schumacher patent 5,315,914 are not made to minimize sound report by a gradual release of gasses directly into the surrounding atmosphere through vents along the length of a gun barrel. Schumacher patent 5,315,914 does not provide the necessary teaching to a person of ordinary skill in the art to minimize sound report by the gradual release of gasses directly into the surrounding atmosphere through vents positioned along the length of a gun barrel without the teaching of the present application.

15. It is my opinion that a person of ordinary skill in the art reviewing the Schumacher patent 5,315,914 would understand that the Schumacher patent 5,315,914 was of a common silencer design and would not have been able to use the disclosure to make the elongate vented gun barrel as described in claims 1 and 19 as indicated above.

All statements made herein of my knowledge are true; all statements made on information and belief are believed to be true; and all the foregoing statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment or both under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of this application and any registration resulting therefrom.

Date: 11-7-06

By: *Al Corzine*  
Alan Corzine

Title: *ABI Consulting, Principal*

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*Application No. 09/923272  
Page 7*

*Declaration  
Attorney Docket No. D55.2B-10027-US01*

EXHIBIT 1

1. A firearm comprising:
  - a) one elongate barrel having a breach end, a muzzle end and a discharge opening, said elongate barrel having a length dimension, said length dimension being of at least 3 1/2 feet; and
  - b) a plurality of vents disposed through said elongate barrel, said vents initiating beyond twelve inches from said breach end, said vents terminating proximate to said muzzle end, said vents having a size of approximately 3/8 inch in diameter or greater, said vents being constructed and arranged to minimize sound report by gradual release of gasses directly to the surrounding atmosphere through said vents along said length dimension of said barrel toward said muzzle end of said firearm following discharge of said firearm, said vents minimizing gas pressure proximate to said muzzle end.
2. The firearm according to claim 1, wherein said elongate barrel has a length of less than 12 feet.
3. The firearm according to claim 2, wherein said elongate barrel is formed of barrel sections.
4. (Withdrawn) The firearm according to claim 3, wherein said barrel sections are releasably coupled to each other.
5. The firearm according to claim 3, wherein said barrel sections are fixedly secured to each other.
6. The firearm according to claim 3, wherein each of said barrel sections have the same length dimension.
7. (Withdrawn) The firearm according to claim 3, wherein at least two of said barrel

*Application No. 09/923272  
Page 8*

*Declaration  
Attorney Docket No. D55.2B-10027-US01*

sections have different length dimensions.

8. The firearm according to claim 3, wherein said elongate barrel has a length of approximately seven feet.

9. The firearm according to claim 2, wherein said plurality of vents are of the same size.

10. (Withdrawn) The firearm according to claim 2, said plurality of vents comprising vents of at least two different sizes.

11. (Cancelled)

12. The firearm according to claim 2, wherein said vents are grouped into at least one sector.

13. (Withdrawn) The firearm according to claim 12, wherein said vents are regularly spaced within each of said sectors.

14. The firearm according to claim 12, wherein said vents are irregularly spaced within each of said at least one sector.

15. The firearm according to claim 12, wherein said vents are the same size within each of said at least one sector.

16. (Withdrawn) The firearm according to claim 12, said vents comprising vents of at least two different sizes within each of said sectors.

17. The firearm according to claim 12, wherein each of said at least one sector have an identical length dimension.

18. (Withdrawn) The firearm according to claim 12, wherein at least two of said sectors

*Application No. 09/923272  
Page 9*

*Declaration  
Attorney Docket No. D55.2B-10027-US01*

have a different length dimension.

19. A firearm comprising:

- a) one elongate barrel having a breach end and a muzzle end, said elongate barrel having a length dimension, said length dimension being of at least 3 ½ feet; and
- b) a plurality of vents disposed through said elongate barrel, said vents initiating beyond twelve inches from said breach end, said vents terminating proximate to said muzzle end, said vents positioned along the barrel to minimize sound report by gradual release of gasses directly into the atmosphere through said vents along said length dimension of said barrel toward said muzzle end of said firearm following discharge of said firearm, said vents reducing gas pressure proximate to said muzzle end.

20. (Cancelled)

21. The firearm according to claim 19, wherein the barrel is constructed of two or more sections.

22. The firearm according to claim 19, wherein the vents have a diameter of approximately 3/8 inch or less.

23. The firearm according to claim 21, wherein at least one section is constructed of material selected from the group consisting of light-weight metal, plastic, and fiberglass.

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### SENIOR EXECUTIVE

- Strategic Planning
- Business Development
- Research & Development
- Change Management
- Marketing / Public Relations
- International Experience

An innovative and energetic leader, skilled communicator / team builder, and adept negotiator, with a record of success in multiple functions spanning from R&D to marketing. Recognized for achievements in driving businesses to greater sales, market share, and profits through instituting cutting-edge, change-management initiatives. The proven ability to introduce cultural change while maintaining or even increasing staff members' level of motivation and enthusiasm for their work.

- Turned around cash-starved business, reducing manufacturing costs 40% in 2 years while growing new product sales 20% and delivering double-digit growth in volume and profits.
- Reengineered 2 underperforming businesses, reducing product time to market 50%, cutting R&D expenses 30%, decreasing engineering costs 20%, increasing fill rates 25%, growing new product sales as a percentage of total sales 100%, and delivering a substantial increase in profits.
- Developed and introduced over 1000 new products annually; won multiple awards for product innovation, with offerings featured on "60 Minutes," "Dateline," and "20/20"; delivered profits on new products that were almost 200% greater than the existing line; grew market share over 25% in 2 years, versus 2-3% industry rate; increased return on PR investment 120% in 3 years, plus managed over 60 PR hunts/events and technical briefings worldwide each year.
- International experience includes leading R&D, manufacturing, business development, and sales / marketing activities on all 7 continents.

### EXPERIENCE

#### Alliant Tech Systems, Anoka, MN. 2002 - 2005

\$4 billion aerospace and defense company specializing in advanced weapons and space systems.

##### Director of Technology - Civil Ammunition and Related Products Group

Responsible for strategic planning, business development, R&D, and engineering for the \$500 million Consumer Products Group offering over 8000 products, which comprise 16 major brands serving recreational, law enforcement, and military users worldwide. Products were produced at 7 domestic facilities as well as internationally through outsource partners in Europe, South America, and the Pacific Rim. Oversaw 8 Managers on direct basis and approximately 80 engineers and technicians on dotted line basis. Reported to President and performed 60% travel.

##### Business Development & Marketing

- Created and implemented cross-functional business strategy teams for ammunition and accessories product development, marketing, and introductory planning, with each team cross-linked between business units and consisting of members from engineering, operations, sales, and marketing.
- Developed and instituted 5-year strategic plan for all 16 product brands, then served as co-lead in rebranding initiative for all the brands.
- Served as Divisional Lead on corporate Business Strategy Council and corporate Technical Council.
- Turned around cash-starved accessories business through energizing new product development, improving manufacturing, and introducing Six Sigma principles into all disciplines. Result: Slashed manufacturing costs 40% in 2 years, increased new product sales 20%, and achieved double-digit volume and profit growth for all brands.
- Reengineered 2 underperforming and separately branded ammunition businesses through consolidating the entities, improving product mix, reducing manufacturing costs, and enhancing sales and marketing, including initiating licensing and partnerships for first-year new product introductions. Result: Within 2 years, the brands dominated their respective markets, with new product time to market reduced 50% through implementing Six Sigma disciplines, R&D expenses decreased 30%, engineering costs cut 20%, fill rates increased 25%, new product sales as a percentage of total sales up 100%, and a substantial increase in profitability.
- Initiated Six Sigma and Lean manufacturing disciplines at all 7 domestic facilities.

Note: Marketing, Product Development, Engineering, Change Management, Manufacturing, and Sales required careful synchronization due to complex trade channel, customer, and product / brand mix within this highly competitive, mature market. Complex assemblies, high-volume manufacturing, short product life cycles, seasonality, slow turns, global competition, and tight margins required precise yet dynamic and flexible Product Development. Success was measured by responsiveness, execution, quality, delivery, and marketing innovation. Growth was at expense of competitive market share.

Alan CorzinePage 2**R&D / Product Development**

- Regained company's former position of technological leader in a mature, cost-competitive industry by developing patented, superior-performance, and customer-focused value-priced products.
- Created and introduced over 1000 new products annually that were either developed internally or licensed. Coordinated all aspects of development, initial manufacturing, and PR launch.
- Established combined R&D Department for accessories and ammunition products.

**Public Relations**

- Established Public Relations Department to leverage accessories and ammunition product portfolios consisting of 16 product brands in 3 trade channels.
- Coordinated over 30 media hunts/events annually to support new products. Successfully integrated customers, writers, and video crews on the same hunts, achieving added value for each and an industry first.
- Set up new product demos in high-tech manufacturing facilities to add extra spin for stories, where the media tested products and toured the facilities. Gained unique coverage, both print and multimedia, plus garnered front-page corporate coverage in recreational publications where stories would not even have been accepted without this innovative marketing approach. Success of this first-time initiative won industry-wide recognition from competitors.
- Established 4 to 1 return on PR investment.

**International Experience**

- Established partnerships in Brazil, the Netherlands, Finland, India, Taiwan, and the Pacific Rim for raw materials sourcing, product development, manufacturing, licensing, advertising, and public relations programs.
- Served as sole US representative to World Council - Shooting Sports.

**ABI Consulting, Salem, IL. 2000 - 2002****Founder & Principal**

Established this consulting company to offer business development, engineering, and marketing services to sporting products companies, law enforcement, and companies seeking military contracts. Performed 40% travel, with representative engagements including:

- Led business formation activities of start-up company seeking to service Homeland Security first responders.
  - Acquired intellectual property, conducted business development initiatives, plus engineered the product and production equipment.
  - Launched product in less than 1 year's time, recovered client's capital investment in 8 months, and delivered 350% rate of return for client.
- Dramatically improved operations and profitability of small entrepreneurial business struggling with in-house production of high-demand, recreational consumer products and contending with limited start-up resources, especially capital and personnel.
  - Established network of domestic and Pacific Rim outsource partners specializing in metallic fabrication, plastic injection molding, and textile cut and sew.
  - Reduced manufacturing costs 40%, resulting in 70% profit level.
  - Increased manufacturing capacity 10-fold.
  - Eliminated pricing risks on commodity raws and seasonal production bottlenecks.
  - Improved fill rates 35%.
  - Facilitated sale of company 2 years later at price equaling 11 times profits.
- Designed and coordinated construction of \$2.5 million veterinary hospital where 9 HVAC systems were required to establish correct interior pressure differentials and exhaust systems for disease and odor control. Facility received 4-year AAHA accreditation, the highest level possible.
- Managed project for mining industry in South Africa; started up power tool facility in Taiwan; transitioned manufacturing to China; provided sales support in the Pacific Rim; and established sales and distribution network in the US for a Swedish company.

Alan Corzine

Page 3

**Olin Corporation - Winchester Division, E. Alton, IL. 1984 - 2000**

Winchester Division was the largest domestic producer of small caliber ammunition, with branch manufacturing facilities in Europe and Australia. Company operated the only US Government arsenal, located outside Kansas City, and produced products for commercial, law enforcement, military, and industrial customers.

**Director - Product Creation and Public Relations**

Managed domestic and international strategic planning, business development, capital planning, R&D, new product development and manufacture, and outdoor media PR for product launch. Oversaw 8 direct reports and over 50 engineers and technicians on dotted line basis. Reported to President and performed 50% travel.

**Business Development**

- Managed networking activities in Europe, Australia, Africa, South America, and the Pacific Rim.
- Established strategic joint venture with Nosler that grew into the most successful and longest standing venture of its kind in the shooting sports business.
- Partnered with Browning/USRAC on development of new cartridge/firearm platform, which became the most successful one introduced in over 50 years and today represents a large percentage of new firearm and ammunition sales for several companies.
- Established and managed strategic licensing and partnerships worldwide.
- Assisted with rebranding and SAP implementation.

**Product Development**

- Drove company to #1 position for innovation in 3 years after establishing a strategic vision, creating R&D Department, combining all new product disciplines under common leadership, and enhancing PR activities. R&D Department was centralized, cross-functional, and linked to manufacturing facilities in Australia, Europe, and Japan.
- Won numerous awards, including "Ammunition New Product of the Year," 4 out of 5 years of eligibility.
- Discovered availability of key scrap material and patented a process to render it useable, resulting in 60% reduction in production costs in highly profitable market segment. Secured exclusive use of worldwide supply. Created separate sub-brand, which is today #1 offering for volume and profitability among competitive products, exceeding their sales by 300%.
- Developed the most successful hollowpoint pistol bullet for Law Enforcement ever produced and is still #1 today. Product was featured on "60 Minutes," "Dateline," and "20/20," and enabled creation of a law enforcement sub-brand.
- Developed continuous motion heading process, licensed from Germany, which forced 2 competitors out of business and is #1 process today.
- Generated 250% rate of return on new products capital investment, plus delivered profits on new products that were almost 200% greater than the existing line.

**Public Relations**

- Coordinated over 60 PR hunts/events and technical briefings worldwide each year.
- Increased return on PR investment 120% in 3 years.
- Established innovative circuit of demos for law enforcement market that grew share over 25% in 2 years, versus 2-3% industry rate, which was considered exceptional. Set up highly successful mirrored approach in Europe.
- Conducted interior, exterior, and wound ballistic seminars for law enforcement and military markets. Invited to major training academies as well as state and federal ranges.

**International Experience**

- Coordinated start-up of manufacturing facility in Finland.
- Designed new safety-enhanced, ergonomic product for South America and Mexico and established network of service providers for on-site repair. Program halted erosion of market share, captured 30% of the market, and drove product to #1 choice among customers.
- Created combined R&D function between US, Italy, and Australia production facilities.
- Managed support and contract management for Australian Defense Industry.
- Managed development and production activities for Scandinavian defense contracts.
- Served as primary technical liaison for international sales and contracts.

Alan Corzine

Page 4

**Program Manager - Centerfire, 1992 - 1995**

Responsible for commercial and military Centerfire product and process development.

- Developed and implemented patented rifle projectile and extrusion process.
- Patented one of the first non-toxic and frangible projectiles for law enforcement.

**Senior Engineer - R&D, 1988 - 1992**

**Engineer - R&D, 1984 - 1988**

**EDUCATION**

B.S., Mechanical Engineering, University of Missouri - Rolla, 1984  
Summa Cum Laude, 3.9/4.0

**PERSONAL**

Married with a family. Grew up in a small Midwest farming community.

Adhere to strong family values and a high moral standard that will not be broken.

Passion for outdoor activities: hunting, shooting, fishing, wilderness hiking and camping, horseback riding, wildlife conservation and land stewardship.